circle; at first the bismuth is positive; in a minute or two the current ceases; but the circuit still conducts the thermo current well

883. Thus whilst sulphuret of bismuth is in the act of formation the current is produced; when the chemical action ceases the current ceases also; though contact continues and the sulphuret be a good conductor. In the case of 'bismuth and lead the chemical action occurs at both sides, but is most energetic at the bismuth,, and the current is determined accordingly. Even in that instance the cessation of chemical action causes the cessation of the current.

884. In these experiments with *lead* and *bismuth* I have given their associations with platinum, gold, palladium, iron, and nickel; because, believing in the first place that the results prove all current to depend on chemical action, then, the quiescent state of the resulting or final circles shows that the contacts of these metals in their respective pairs are *without force* (817): and upon that again follows the passive condition of all those contacts which can be produced by interposing other conducting bodies between them (821); an argument that need not again be urged.

885. *Copper*.—This substance being associated with platinum, gold, iron, or any metal chemically inactive in the solution of sulphuret, gives an active circle, in which the copper is positive through the electrolyte to the other metal. The action, though it falls, does not come to a close as in the former cases, and for these simple reasons; that the sulphuret formed is not compact but porous, and does not adhere to the copper, but separates from it in scales. Hence results a continued renewal of the chemical action between the metal and electrolyte, and a continuance of the current. If after a while the copper plate be taken out and washed and dried, even the wiping will remove part of the sulphuret in scales, and the nail separates the rest with facility. Or if a copper plate be left in abundance of the solution of sulphuret, the chemical action *continues,* and the coat of sulphuret of copper becomes thicker and thicker.

886. If, as Marianini has shown,[1] a copper plate which has been dipped in the solution of sulphuret, be removed before the coat formed is so thick as to break up

from the metal
beneath, and be washed and dried, and then
replaced, in associa-
tion with platinum or iron, in the solution, it
will at first be
neutral, or, as is often the case, negative (815,
826) to the

[1] *Memorie della Societa Italiana in Modena,* 1837, xxi. 224.